National Defence
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THE PROTECTION OF MARINE MAMMALS IN CANADA

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Defence Research Establishment Atlantic

Centre de Recherches pour la Défense Atlantique

Canada

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Approved by R.E. Erickson:
Head Electromagnetics Section

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Abstract

This report gives an overview of the efforts to protect marine mammals and their habitats in Canada. The socio-economic impact that commercial whaling, sealing, and overfishing have had on the general public is highlighted in order to understand why Canadians care about the long-term perpetuation of our diverse national ecosystems. Canada has initiated many programs to identify and recover species at risk and the three examples discussed epitomize these efforts. Finally, the conservation of all forms of wildlife in this country, whether abundant or endangered, is engrained in our federal statutes and regulations and several examples are given.

Résumé

Le rapport donne une vue d'ensemble des efforts déployés pour protéger les mammifères marins et leurs habitats au Canada. L'impact socio-économique que la chasse commerciale à la baleine et aux phoques et la surpêche ont eu sur le grand public est mis en évidence, ce qui permet de comprendre pourquoi les Canadiens se soucient de la perpétuation à long terme de nos divers écosystèmes nationaux. Le Canada a mis en oeuvre plusieurs programmes pour identifier et protéger les espèces en danger, et les trois exemples donnés résument bien ces efforts. Enfin, la conservation dans notre pays de toutes les formes de faune et de flore, qu'elles soient abondantes ou en danger, est enracinée dans nos lois et règlements fédéraux, et plusieurs exemples sont donnés.

Executive Summary

Report Number:

DREA Technical Memorandum 98/217

Title:

The Protection of Marine Mammals in Canada

Author:

Dennis F. Jones

Background:

The Defence Research Establishment Atlantic (DREA) periodically performs experiments at sea in order to fulfil its mandate to research and develop modern naval systems. In so doing, we have to be increasingly diligent in keeping abreast of national programs and legislation that protect marine ecosystems in the areas in which we operate. This is especially important for DREA since we often mount trials on the continental shelf off Nova Scotia, which is a region rich in biodiversity. This report is intended to bring DREA managers and researchers up to date on the rapidly evolving activities regarding the protection of marine mammals in Canada.

Results:

This report shows that Canadians are concerned with the conservation and protection of marine mammals and their habitats. Politicians are keenly aware of this public sentiment and are responding by formulating new federal laws and creating new marine wildlife safe havens that promise to satisfy those concerns. This report reviews many of these initiatives.

Significance:

Issues arising from existing programs and statutes concerning the protection of aquatic animals and plants in Canada's ocean waters should be factored into the planning stages of DREA sea trials. This is most easily done through our environmental assessment process. Since important initiatives such as the creation of Marine Protected Areas under the new *Oceans Act* may impact on where DREA will be permitted to do sea trials, it is critical that we be aware of the fact and be prepared to take the necessary precautions.

Future Plans:

The report recommends further studies to determine the distribution of marine mammals in waters important to DREA sea trials. This includes Canadian waters and adjacent waters that fall under the jurisdictions of other nations, namely, France (St. Pierre and Miquelon), Denmark (Greenland), and the United States.

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Glossary of Terms

Abyssopelagic: Water depths exceeding 2000 metres.

Baleen: Plates that hang from the upper jaw of large toothless whales and filter food from the seawater.

Bathypelagic: Water depths between 1000 and 2000 metres.

Biodiversity: The total number of different types of organisms in a specific region.

Biota: The microorganisms, plants, and animals in a given area.

Bluebacks: Common name for newborn hooded seal pups in reference to their short slate-blue pelage.

Callosities: Irregular protuberances of keratin on right whales. White or yellowish colouring of callosities is due to infestations of whale lice.

Cetacean: Whales, dolphins, and porpoises that are carnivorous marine mammals and belong to the order Cetacea.

Common name: Descriptive name given to a species that usually depicts a physical characteristic, the habitat, or the author of the species.

Continental shelf: Gently sloping extension of the continental crust under the marginal seas that surround most continents.

COSEWIC: Acronym for the Committee on the Status of Endangered Wildlife in Canada.

Ecosystem: The physical and biological environment of a community of organisms, their interactions with each other, and their interactions with their environment.

Endangered status: A species, subspecies, variety, or geographically defined population facing imminent extirpation or extinction.

Exclusive economic zone: Marine waters off the coast of Canada out to 200 nautical miles.

Extinct status: A species, subspecies, variety, or geographically defined population that no longer exists.

Extirpated status: A species, subspecies, variety, or geographically defined population no longer existing in the wild in Canada, but occurring elsewhere.

Federal lands: Federal government owned lands including the internal waters, territorial sea, exclusive economic zone, and continental shelf of Canada.

Flukes: The lateral tail of a cetacean used to propel the body through the water.

Groundfish: Fish usually caught near the ocean floor such as cod, haddock, redfish, and halibut.

Habitat: A geographic area that can support the essential life activities for a population or an individual.

Indeterminate status: A species, subspecies, variety, or geographically defined population for which there is insufficient scientific information to support status designation.

Internal waters: Marine waters surrounded primarily by Canadian coastline such as the Gulf of St. Lawrence and Hudson Bay.

Krill: A Norwegian word for 'whalefood', this tiny shrimplike crustacean is full of protein and frequently swarms, making them easy prey for many whale species.

Marine Mammals: Aquatic animals that have mammary glands for the nourishment of their young and consequently belong to the class Mammalia.

MBS: Acronym for Migratory Bird Sanctuary.

MPA: Acronym for Marine Protected Area.

MWA: Acronym for Marine Wildlife Area.

NMCA: Acronym for National Marine Conservation Area.

Not at risk status: A species, subspecies, variety, or geographically defined population that has been evaluated and found to be not at risk.

NSSN: Acronym for the Nova Scotia Stranding Network.

NWA: Acronym for National Wildlife Area.

Pelagic: Pertaining to the marine aquatic environment at all depths excluding the bottom and shore.

Pinniped: Fin-footed carnivorous marine mammals such as seals and sea lions.

Plankton: Tiny plants or animals that drift near the surface of the sea and form the basic food source for many marine mammals and fish.

RENEW: Acronym for the committee on the Recovery of Nationally Endangered Wildlife.

Scientific name: A two-word name for an organism consisting of the genus (first letter capitalized) and the species, and usually originating from Latin.

Species: A taxonomic grouping of similar plants or animals of common ancestry that can produce fertile offspring.

Spermaceti: A large organ in the head of the sperm whale that is believed to control buoyancy and sound directionality.

Staging areas: Regular stopping places on the routes of migratory birds, usually for resting and feeding.

TAGS: Acronym for The Atlantic Groundfish Strategy compensation package.

Territorial sea: Marine waters off the coast of Canada out to 12 nautical miles.

Threatened status: A species, subspecies, variety, or geographically defined population likely to become endangered if limiting factors are not reversed.

Vulnerable status: A species, subspecies, variety, or geographically defined population of special concern because of characteristics that make it particularly sensitive to human activities or natural events.

Whelping Grounds: Areas where marine mammals such as seals and walruses give birth to their pups and calves, respectively.

Whitecoats: Common name for newborn harp seal pups in reference to their soft white coats.

1. Introduction

Bounded by the Atlantic, Pacific, and Arctic Oceans, Canada possesses almost 244,000 kilometres of coastline, the longest in the world. Combined with a 200 nautical mile exclusive economic zone, unilaterally established in 1977, Canada is custodian to more than 4 million square kilometres of ocean. These contiguous waters include coastal and open ocean regions, estuaries, bays, inlets, coves, and fjords. As a party to numerous international treaties, conventions, agreements, and guidelines on conserving the seas, we are obligated to protect the biota and ecosystems found in these vast waters surrounding our nation [1].

Examples of our rich marine biodiversity range from ringed seals (*Phoca hispida*) diving for cod through breathing holes in stable land-fast ice in Arctic and sub-Arctic waters [2] to sea otters (*Enhydra lutris*) searching for sea urchins in giant underwater kelp forests in temporate waters [3]. The world's largest reptile, the leatherback turtle (*Dermochelys coriacea*), can dive to bathypelagic water depths to feed on giant jellyfish [4]. Whales are found in many habitats including rivers and fjords where belugas (*Delphinapterus leucas*) hunt for capelin and eels [5], bays and offshore banks where northern right whales (*Eubalaena glacialis*) surface feed on krill and plankton [6], and deep abyssopelagic waters where sperm whales (*Physeter macrocephalus*) forage for deepwater squid [7].

The Defence Research Establishment Atlantic (DREA) operates both a research ship and a stationary acoustic calibration barge on ocean water. From time to time our research ship encounters marine mammals at sea and our barge is sometimes visited by inquisitive cetaceans and pinnipeds. In keeping with our national mandate to protect marine mammals, DREA must strive to take all precautions necessary to avoid ship/mammal collisions, excessive noise levels from sonar transducers and arrays, and the introduction of pollutants into the water, all of which could disturb or injure marine mammals and damage their habitats.

Appropriate precautions with regards to DREA's activities at sea can be better realized with a basic understanding of the programs, regulations, guidelines, and statutes that aim to protect marine mammals in Canada. Thus, the purpose of this paper is to provide this understanding. We begin by discussing public awareness on the protection of marine mammals in Section 2. A discussion of national programs to identify and recover species at risk is given in Section 3, along with guidelines for whale watching and findings of a regional cetacean stranding network. Existing and proposed Canadian statutes on the protection of species at risk are summarized in Section 4.

2. Public Awareness

For the most part, Canadians are genuinely concerned with matters relating to the conservation and protection of our environment. We are regularly exposed to environmental issues through television, film documentaries, newspapers, as well as many dedicated nature magazines. Conservation and protection of endangered species are promoted at our national parks, natural history museums, aquariums, and zoos. In fact, our children are being educated in the subjects of conservation and the environment in both private and public schools as never before in this country.

In 1991, a comprehensive study of Canadian attitudes toward marine mammal conservation and management was undertaken as a result of controversies over the exploitation of marine resources, such as oil and gas, commercial fish, and seals [8]. When asked if they were "proud to live in a country that had restored rare whales and seals to their previous abundance", 92.1% of the general public agreed. When asked if they "support the protection of endangered whales in the North Atlantic even if oil development has to be curtailed" the support was 83.5%. When asked if they "support passing a law to protect areas of the ocean important to marine mammals, even if it results in less commercial activity in these areas" the support was 82.3%.

Hence, with strong public support for the protection of marine mammals and their habitats, Canada signed and ratified the United Nations *Convention on Biological Diversity* at the Earth Summit in Rio de Janeiro, which took place in 1992 [9]. Essentially, this action committed Canada to develop new or maintain existing statutes and regulations to protect threatened species and their habitats. We will discuss in Section 4 what has transpired since 1992 with regards to new Canadian legislation to protect marine mammals.

Understanding why Canadians are concerned about the welfare of marine mammals requires a brief look at three well-known contentious commercial activities that have taken place in the oceans surrounding Canada. These activities, involving the exploitation of aquatic animals, are commercial whaling (Subsection 2.1), whitecoat and blueback sealing (Subsection 2.2), and commercial overfishing (Subsection 2.3). We also discuss a recent publication regarding whales and naval sonars in Subsection 2.4.

2.1 The Impact of Whaling

Commercial whaling in Europe began around the 12th century with the exploitation of northern right whales (*Eubalaena glacialis*) for oil used in soaps and street lamps [10]. By the 16th century, these whale stocks began to decline so European whaling activities expanded to the shores of North America where bowhead whales (*Balaena mysticetus*) were also taken. From the 17th to the 20th centuries the whaling industry developed new technologies such as the explosive harpoon and the factory ship, and also expanded its product base. Whale oil was used for candle wax, cosmetics, and paints, baleen was used for fishing rods, umbrella ribs, skirt hoops, and corset stays, and highly valued spermaceti oil from the sperm whale (*Physeter macrocephalus*) was used for machine lubricants.

The number of countries that participated in whaling proliferated and new oceans were systematically hunted. From the Arctic, to the South Atlantic, to the Pacific, and finally to the Antarctic, commercial whaling was relentless. This pattern of discovering new species and stocks, depleting them until they were unprofitable, and moving on to new ocean areas imperiled many whale species as well as the whale industry itself.

Whaling activities in the Antarctic grew to unprecedented levels in the 1900s [11]. Tens of thousands of blue whales (*Balaenoptera musculus*) were taken and when their numbers were drastically reduced, whalers switched to fin whales (*Balaenoptera physalus*). After tens of thousands of fin whales were taken, whalers turned their attention to sei whales (*Balaenoptera*

borealis) and minke whales (*Balaenoptera acutorostrata*). In all, more than a million whales were taken from these southern waters.

In order to prevent the extinction of many whale species, the International Whaling Commission began to impose quotas on whale catches shortly after World War II [12]. However, as whaling continued to exact a heavy toll on these marine mammals, public opposition to the whaling industry's activities began to grow, especially in the 1970s and 1980s. Furthermore, with economic pressure bearing down on the whaling industry from synthetic products made from petroleum, spring steel, and plastics, to name a few, the industry was in trouble. Finally, on 1 January 1986 a worldwide moratorium on commercial whaling was adopted by the International Whaling Commission.

Today, only a few nations have active whaling fleets despite the ban, however, there are other pro-whaling nations that argue that there are enough whales to resume commercial whaling for some species in the Atlantic and Antarctic Oceans [10]. Although the last whaling stations in Canada closed in 1972 [13], aboriginal subsistence hunting has resumed in the emerging territory of Nunavut, which will be officially established in 1999 in accordance with the *Nunavut Act*. Since the 1993 *Nunavut Land Claims Agreement Act* states that the Inuit peoples have "wildlife harvesting rights and rights to participate in decision-making concerning wildlife harvesting", traditional hunting of a bowhead whale (*Balaena mysticetus*) took place in 1996 [14]. Once again, there is controversy over subsistence hunting of bowhead whales since they are officially listed as endangered in this country (see Subsection 3.1).

2.2 The Impact of Sealing

Another activity that captured the interest of the public in many countries was the annual confrontation between sealers and anti-sealing protest groups over the commercial seal pup harvest on the whelping grounds in Eastern Canada, which came to a head in the early 1980s [2]. Both whitecoat harp seals (*Phoca groenlandica*) and blueback hooded seals (*Crystophora cristata*), whose pelts sold mainly to European markets, were the main marine mammals at the centre of this controversy.

By 1983, public opinion was dead set against the clubbing of these newborn seals, prompting the European Economic Community to ban imported products made from whitecoats and bluebacks. This collapse of the primary market due to public pressure, caused the Royal Commission on Seals and Sealing in Canada to say in its 1986 report "The Royal Commission therefore believes that the killing of the pups of harp seals (whitecoats) and hooded seals (bluebacks) for commercial purposes should not be permitted" [15]. This recommendation was put into practice by the Canadian government by 1987.

When Canadians were asked if they were "opposed to the hunting of baby seals under any circumstance" in a 1991 poll [8], the general public agreed by 70.7%, sealers marginally agreed by 53.6%, and fishermen marginally disagreed by 55.3%. Clearly the seal pup controversy had left a lasting impression in the minds of Canadians and as we shall see in Subsection 2.3, a seal debate has once again come to the forefront in this country, albeit by an indirect route.

2.3 The Impact of Overfishing

Commercial overfishing is a worldwide environmental problem that has threatened the survival of many fish stocks over the last two decades. Canadians relying on the fisheries for a living have felt the devastating effects firsthand, prompting our government to respond to foreign fishing by friendly countries inside (and outside of) our exclusive economic zone, with a boldness that has sometimes surprised the world [16]. We briefly mention some of these international disputes and possible consequences for marine mammals.

When Canada established its 200 nautical mile exclusive economic zone in 1977, a territorial dispute between Canada and France was ignited since France did the same. At issue was the ownership of the ocean resources, including Atlantic cod, around the French islands of St. Pierre and Miquelon located just south of Newfoundland [16]. Although France did send a warship to patrol these disputed waters in 1985, the matter was eventually settled peacefully in 1989 through binding arbitration under the *Law of the Sea Convention*. Both countries continued to fish for cod however.

Canada's disputes over fish stocks with the United States were more energetic than those with France. The most significant dispute was over migrating Pacific salmon stocks that spend time each year in both Canadian and American waters. When the *Pacific Salmon Treaty* between Canada and the United States was not renewed in 1991, salmon were fished heavily by both countries [16]. In the six years that followed there were fishery closures, boat seizures, blockades, fines, lawsuits, and more heavy fishing. Today, as the disputes continue, the salmon stocks are being closely monitored in an attempt to revive a sustainable salmon fishery.

The first factory-freezer trawler began fishing for Atlantic cod on the Grand Banks off Newfoundland in 1956. With advances in other fishing technologies like modern nets and rigging, groundfish stocks began to decline in the 1970s. Other contributing factors included fishing in spawning grounds and fishing for the pelagic fish capelin, one of the key food sources for cod. Cod stocks continued to decline in the 1980s and by 1988 drastic reductions in the total allowable catch were being proposed. Finally, when the situation became critical in 1992, a moratorium was announced and the cod fishery was closed. When The Atlantic Groundfish Strategy (TAGS), worth almost $2 billion dollars, was announced in 1994, nearly 40,000 affected fishermen and plant workers claimed support [16]. As the expiration of TAGS approaches, the public debate over compensation is intensifying. With the cod fishery closed, increased pressure has come to bear on other resources such as crab, shrimp, scallop, lobster, Atlantic salmon, and seaweed, with significant declines in some of these resources noticed as early as 1996, when, for example, the Bay of Fundy scallop stock collapsed [16].

With so many Canadian fishing communities devastated by the closure of the cod fishery, a critical eye was cast on foreign trawlers fishing stocks that straddled the 200 mile exclusive economic zone on the Grand Banks. The situation came to a very high energy level in 1995 when a Canadian patrol boat fired her guns at a Spanish trawler attempting to evade boarding by officers on Department of Fisheries and Oceans and Canadian Coast Guard vessels [16]. This act triggered the start of the Turbot War in reference to the turbot that was being fished. The dispute over straddling stocks culminated in early 1995 with high speed chases involving 17 European

Union trawlers, 2 Spanish frigates, and 6 Canadian patrol vessels backed up by Canadian naval warships and submarines. Fortunately, an all out shooting war was avoided but an Angus Reid poll taken at the time showed that 90% of Canadians approved of the actions taken by our government [16].

In an attempt to find employment for Eastern Canadian communities suffering from the groundfish fishery closures, new markets and products have been actively pursued for harp and hooded seals. As these markets continue to grow, so too has the total harvest [17]. Thus, the 1997 harvest of harp seals was 261,000, more than four times the average annual harvest prior to 1996. In addition, concerns have been raised that the increasing populations of seals may be hindering the recovery of depleted groundfish stocks since these seals consume tens of thousands of tonnes of Atlantic cod and capelin in the Atlantic region each year [16]. Further scientific studies on the effects of seals on the recovery of groundfish stocks are continuing.

Many whales, migratory and year-round residents, rely on fish for food in the ocean waters of Eastern Canada. The serious decline in fish stocks may have an effect on the populations of these marine mammals, especially if these fish stocks do not recover in the not too distant future. As well, depleted fish stocks could alter marine mammal migration routes and distributions.

2.4 Naval Sonar and Whales

It is clear from the discussions above that the Canadian public and the federal government take matters related to marine mammals and other aquatic animals very seriously. Canada is also home to many animal rights groups with memberships that include a broad spectrum of people ranging from the passive environmentalist to the proactive adventurer. So, when new issues arise concerning the welfare of aquatic animals around the world, it is almost certainly the case that Canadians will get involved.

One such issue is the effect that high-power naval sonar systems may have on marine mammals. In particular, environmentalists have attempted to link the stranding of several Cuvier's beaked whales (*Ziphius cavirostris*) in the Mediterranean Sea with the activities of a North Atlantic Treaty Organization research vessel in 1996. The latest article on the subject appeared in the June 1998 issue of *Canadian Wildlife* [18]. Although very little is known about the effects of naval sonars on marine mammals generally, and beaked whales specifically [19], the subject is receiving priority attention by those involved with naval sonar programs.

3. Programs Concerned with the Protection of Species at Risk

Canada's commitment to conserving wildlife includes dedicated programs that aim to identify, protect, and recover species at risk. In this section we introduce new and established programs intended to protect wild animals, plants, and their habitats across the nation, however, the main focus will be on marine mammals and ecosystems. Subsections 3.1 and 3.2 introduce the committees responsible for listing and recovering species at risk. Subsections 3.3, 3.4, and 3.5 discuss the first Canadian cetacean recovery program, guidelines for whale watching, and the activities and findings of one Canadian cetacean stranding network, respectively.

3.1 Committee on the Status of Endangered Wildlife in Canada

Formed in 1977 and supported by the Environment Canada's Canadian Wildlife Service, the Committee on the Status of Endangered Wildlife in Canada (COSEWIC) is responsible for reviewing the status of Canadian species at risk. An official list is produced in the spring of each year based on sound scientific evidence and the deliberations of experts from provincial, territorial, and federal governments, national conservation organizations, museums, and universities. The mandate of COSEWIC is to "determine the national status of wild species, subspecies, varieties, and nationally significant populations that are considered to be at risk in Canada" [20].

The risk categories used by COSEWIC are defined in Table 1. These categories include extinct, extirpated, endangered, threatened, and vulnerable species and populations, as well as those not at risk or for which there is not enough information to make a definitive designation. Ten taxonomic groups are covered: fish, amphibians, reptiles, birds, terrestrial and marine mammals, molluscs, lepidoptera, vascular plants, mosses, and lichens. Also included in the COSEWIC listing is a chronological record of status reexaminations, the year in which the risk category was assigned, and the Canadian geographical location for each species or population.

Table 1: COSEWIC species risk categories and definitions.

Risk Category	*COSEWIC Definition*
Extinct	A species, subspecies, variety, or geographically defined population that no longer exists.
Extirpated	A species, subspecies, variety, or geographically defined population no longer existing in the wild in Canada, but occurring elsewhere.
Endangered	A species, subspecies, variety, or geographically defined population facing imminent extirpation or extinction.
Threatened	A species, subspecies, variety, or geographically defined population likely to become endangered if limiting factors are not reversed.
Vulnerable	A species, subspecies, variety, or geographically defined population of special concern because of characteristics that make it particularly sensitive to human activities or natural events.
Not at Risk	A species, subspecies, variety, or geographically defined population that has been evaluated and found to be not at risk.
Indeterminate	A species, subspecies, variety, or geographically defined population for which there is insufficient scientific information to support status designation.

The April 1997 COSEWIC listing contained a number of marine mammal species and populations [20]. The sea mink (*Mustela macrodon*) from New Brunswick and Newfoundland has been extinct since 1894 and was the only marine mammal listed in this category. Two marine mammals were listed as extirpated: the Northwest Atlantic population of the Atlantic walrus (*Odobenus rosmarus*) by 1850 and the Atlantic population of gray whale (*Eschrichtius robustus*) prior to 1800.

Six populations of three whale species were listed as endangered: the distinct Eastern and Western Arctic populations of the bowhead whale (*Balaena mysticetus*), the Atlantic and Pacific Ocean population of the northern right whale (*Eubalaena glacialis*), and the St. Lawrence River, Ungava Bay, and Southeast Baffin Island-Cumberland Sound populations of the beluga (white whale) (*Delphinapterus leucas*). Four species and populations were listed as threatened. They included the Pacific Coast sea otter (*Enhydra lutris*), the Northwest Atlantic population of the harbour porpoise (*Phocoena phocoena*), the North Pacific population of the humpback whale (*Megaptera novaeangliae*), and the Eastern Hudson Bay beluga population (*Delphinapterus leucas*).

Seven species and populations of seals and whales were designated as vulnerable. They included the landlocked Lacs des loups marins population of harbour seal (*Phoca vitulina mellonae*), the Atlantic and Pacific Ocean population of the blue whale (*Balaenoptera musculus*), the Atlantic and Pacific Ocean population of the fin whale (*Balaenoptera physalus*), the Western North Atlantic population of the humpback whale (*Megaptera novaeangliae*), the Atlantic Ocean-Gully population of the northern bottlenose whale (*Hyperoodon ampullatus*), the Atlantic Ocean Sowerby's beaked whale (*Mesoplodon bidens*), and the Eastern High Arctic-Baffin Bay population of the beluga (*Delphinapterus leucas*).

Two marine mammals were examined and designated as indeterminate. They were the Pacific Ocean harbour porpoise (*Phocoena phocoena*) and the dwarf sperm whale (*Kogia simus*). Thirty-two species and populations were examined and designated as not at risk (see Table 2).

3.2 Committee on the Recovery of Nationally Endangered Wildlife

The committee on the Recovery of Nationally Endangered Wildlife (RENEW) was established in 1988 in response to the growing numbers of endangered species in Canada, as identified by COSEWIC. Their objectives are as follows [21]:

> "No endangered species in Canada will be allowed to become extirpated or extinct. No new species will be allowed to become threatened or uplisted to endangered. When and where possible, extirpated species will be reintroduced to Canada. Recovery plans will be prepared for all threatened and endangered species. Recovery programs will be initiated, where feasible, to work towards removing species from threatened, endangered or extirpated status."

Table 2: COSEWIC species designated not at risk.

Common Name	*Scientific Name*	*Population*
Atlantic white-sided dolphin	Lagenorhynchus acutus	Atlantic Ocean
Bottlenose dolphin	Tursiops truncatus	Atlantic Ocean
Common dolphin	Delphinus delphis	Atlantic & Pacific Oceans
Northern rightwhale dolphin	Lissodelphis borealis	Pacific Ocean
Pacific white-sided dolphin	Lagenorhynchus obliquidens	Pacific Ocean
Risso's dolphin	Grampus griseus	Atlantic & Pacific Oceans
Striped dolphin	Stenella coeruleoalba	Atlantic & Pacific Oceans
Narwhal	Monodon monoceros	Arctic Ocean
Dall's porpoise	Phocoenoides dalli	Pacific Ocean
Bearded seal	Erigrathus barbatus	Arctic & Atlantic Oceans
Hooded seal	Cystophora cristata	Atlantic Ocean
Northern elephant seal	Mirounga angustirostris	Pacific Ocean
Northern fur seal	Callorhinus ursinus	Pacific coastal waters
Ringed seal	Phoca hispida	Arctic & Atlantic Oceans
California sea lion	Zalophus californianus	Pacific Ocean
Steller sea lion	Eumetopias jubatus	Pacific Ocean
Atlantic walrus	Odobenus rosmarus	Eastern Arctic
Baird's beaked whale	Berardius bairdii	Pacific Ocean
Blainville's beaked whale	Mesoplodon densirostris	Atlantic Ocean
Cuvier's beaked whale	Ziphius cavirostris	Atlantic & Pacific Oceans
False killer whale	Pseudorca crassidens	Pacific Ocean
Gray whale	Eschrichtius robustus	Northeast Pacific
Hubb's beaked whale	Mesoplodon carlhubbsi	Pacific Ocean
Long-finned pilot whale	Globicephala melas	Atlantic Ocean
Northern bottlenose whale	Hyperoodon ampullatus	Atlantic Ocean
Pygmy sperm whale	Kogia breviceps	Atlantic & Pacific Oceans
Short-finned pilot whale	Globicephala macrorhynchus	Pacific Ocean
Sperm whale	Physeter macrocephalus	Atlantic & Pacific Oceans
Stejneger's beaked whale	Mesoplodon stejneri	Pacific Ocean
True's beaked whale	Mesoplodon mirus	Atlantic Ocean
Beluga	Delphinapterus leucas	Beafort Sea-Arctic Ocean
Beluga	Delphinapterus leucas	Western Hudson Bay

The RENEW committee consists of representatives from all provincial and territorial governments, the federal government, and three wildlife groups: the Canadian Nature Federation, the Canadian Wildlife Federation, and the World Wildlife Fund Canada. Individuals from many government and non-government organizations make up the recovery teams working in the field.

Over the last decade, RENEW's focus has been on terrestrial vertebrates. Mammals such as the endangered Newfoundland population of marten (*Martes americana atrata*) are being bred in captivity and the extirpated swift fox (*Vulpes velox*) has been reintroduced to the western prairies. Birds are also subjects of recovery projects such as the endangered eastern and prairie populations of the piping plover (*Charadrius melodus*) and the endangered eastern population of the Harlequin duck (*Histrionicus histrionicus*). As well, recovery efforts are underway for a variety of reptiles and amphibians. Since it is well recognized that the declines in some species are directly related to habitat loss or degradation, the first ecosystem-based recovery plan is underway for extirpated, endangered, and threatened species in the South Okanagan grasslands of British Columbia. As we shall see in Subsection 4.5, similar programs are envisioned for marine ecosystems.

Discussions are currently underway to bring new taxonomic groups, such as plants, fish, insects, and marine mammals, within the mandate of RENEW. That being said, the first Canadian recovery plan for a cetacean, outside of RENEW but based on their guidelines, has already been proposed and we outline this plan in the following section.

3.3 The St. Lawrence Beluga Recovery Plan

In 1997, the St. Lawrence population of beluga (*Delphinapterus leucas*) was designated endangered by COSEWIC. Only about 525 belugas were believed to live in the St. Lawrence estuary stock in 1992. Today, these marine mammals are primarily threatened by toxic pollutants and heavy commercial shipping, although other potentially harmful factors include recreational activities, whale watching, coastal development, and entanglement in fishing gear [22].

Another factor that may be threatening the beluga, is competition for food. Like humans and seals, the beluga operates near the top of the food chain and must compete for St. Lawrence fish such as cod, capelin, herring, and smelts. Declines in some fish stocks and increases in the populations of resident and migratory seal stocks (mentioned in Subsection 2.3) may put new pressure on the St. Lawrence beluga.

A St. Lawrence Beluga Recovery Team of experts was assembled by the Department of Fisheries and Oceans and the World Wildlife Fund Canada to develop a St. Lawrence Beluga Recovery Plan in 1994 [22]. Team members included individuals trained in a wide variety of specialized fields from both government and non-government organizations. The goal is to downlist the beluga from endangered to vulnerable, which, according to the Recovery Team, could take more than 20 years given the tremendous amount of collaboration and cooperation that will be required between the federal governments of Canada and the United States, the provincial government of Québec, and a host of industries and agencies to mention a few [22].

The recovery plan summarized the status of the St. Lawrence beluga stock in 1995 in great detail. Included was a discussion of the past and present ranges of the beluga, their causes of death as determined by necropsies carried out over more than a decade, their population trends based on two decades of visual and photographic counts plus a decade of stranding data, and their natural and manmade threats. The proposed strategies to reduce these threats and hopefully improve the survival chances of this beluga stock are given below [22]:

> "Achieve, in the St. Lawrence ecosystem, an overall reduction in toxic contaminants believed to be having an impact on belugas. Reduce disturbance caused by human activities in areas frequented by belugas. Prevent ecological catastrophes and ensure emergency preparedness. Monitor the state of the population. Investigate other potential obstacles to beluga recovery."

Each strategy listed above was broken down into many separate tasks and each task was categorized as an action, monitoring, or research activity. Task priorities and agencies that would carry out the work were assigned. Wherever possible, costs were estimated. The plan was set to be implemented in 1996 and is expected to continue beyond the year 2005.

3.4 Whale Watching Guidelines

Whale watching in Canada has grown over the last two decades from a pastime to a multi-million dollar tourism industry. On the Atlantic coast, one can view humpback whales (*Megaptera novaeangliae*) in the Gulf of St. Lawrence from look-offs on Cape Breton Island, and fin whales (*Balaenoptera physalus*) near Brier Island in the Bay of Fundy [23]. On the Pacific coast, migrating gray whales (*Eschrichtius robustus*) can be seen off the Queen Charlotte Islands and pods of killer whales (*Orcinus orca*) can be seen almost daily in the waters of Johnstone Strait off Vancouver Island [24]. Whale watching is also popular in the Canadian Arctic where the bowhead whale (*Balaena mysticetus*), the narwhal (*Monodon monoceros*), and the beluga (*Delphinapterus leucas*) are found.

With so many whale watching boats in the coastal waters of Canada, there are concerns over the well-being of the whales and the safety of the whale watchers themselves. Whales can be injured by propellers or chased away from their habitats during feeding, while the tourists can be injured or killed by breaching whales that land on their boats. In order to provide for the protection of both mammals (whales and humans), the Department of Fisheries and Oceans have published guidelines for whale watchers and tour operators [25].

According to the *Fisheries Act* (Subsection 4.4), the harassment of marine mammals is strictly prohibited. Thus, whales are not to be hunted, chased, followed, dispersed, or disturbed when resting, feeding, or travelling [25]. The guideline for aircraft flying over whales is that they "do not descend lower than 450 metres from the water" so that their engine noise, as received by whales at the water surface, is kept to a minimum [25]. Whether whale watching or not, boat operators should be cautious in areas where whales are known to reside so that collisions can be avoided. The guidelines for small water-craft are given below [25]:

"If one or several whales are sighted in the vicinity of your vessel, avoid any sudden speed or course changes. If you are less than 300 metres from an animal, reduce speed and advance slowly, using an oblique line of approach. Avoid heading directly toward the whale. Do not go closer than 100 metres of a whale, dolphin, or porpoise. The animal may choose to come much closer to you; if it does, do not chase it and be wary of any individual that appears to be tame. Keep clear of the flukes. When you are at a distance of 100 metres, shift your motor into neutral or idle. If you must use your motor to hold your position, keep your speed down. If you have a sailboat with an auxiliary motor, leave it in idle to signal your presence or turn on your echosounder. When leaving the location, start out slowly and wait until you are more than 300 metres from the animal before accelerating. Travel parallel to whales. If it is impossible to detour around a whale or a pod of whales, slow down immediately and wait until you are more than 300 metres away before resuming speed."

Responsible whale watching tour operators can also play a key role in helping to protect endangered whale species by taking photographs of whales for identification purposes. Individual whales can be uniquely identified by their markings, such as the colour patterns on the flukes of vulnerable humpback whales (*Megaptera novaeangliae*), or the arrangements of callosities on the heads of endangered northern right whales (*Eubalaena glacialis*). This information can be very useful for studying the migratory behaviours of these mammals. Also, by reporting the locations of whales to the Canadian Coast Guard, which in turn are transmitted to commercial ships headed through the Bay of Fundy to Saint John Harbour in New Brunswick, operators help to prevent ship/whale collisions with the most endangered large whale, the northern right whale.

3.5 Nova Scotia Stranding Network

The Nova Scotia Stranding Network (NSSN) was formed in 1990 in response to the stranding of several long-finned pilot whales (*Globicephala melas*) in northwestern Nova Scotia. The objectives of this organization are twofold; to document and research stranded animals and to bring these stranding events to the attention of all Nova Scotians through public awareness and education activities [26].

During the period 1991-1996, NSSN compiled a Nova Scotia cetacean stranding database using information gathered from various sources throughout the province. This database contains 65 reported strandings and a total of 10 positively identified cetacean species. More than 92% of the stranding events involved single mammals and the largest mass stranding involved 26 Atlantic white-sided dolphins (*Lagenorhynchus acutus*) in 1992. On two occasions, the first in 1991 and the second in 1994, 5 long-finned pilot whales stranded. Also, in 1991, 2 sperm whales (*Physeter macrocephalus*) stranded. Although most of these animals die, about 10% were released alive. A list of only the strandings with positive species identification is given in Table 3 (from Ref. 26).

Table 3: 1991-1996 cetacean strandings in Nova Scotia from Ref. 26.

Common Name	*Scientific Name*	*Number Stranded and Date*	
Sperm whale	Physeter macrocephalus	2	25 Apr 1991
Long-finned pilot whale	Globicephala melas	5	29 Jul 1991
Atlantic white-sided dolphin	Lagenorhynchus acutus	1	1 Aug 1991
Minke whale	Balaenoptera acutorostrata	1	11 Jul 1992
Atlantic white-sided dolphin	Lagenorhynchus acutus	26	11 Jul 1992
Humpback whale	Megaptera novaeangliae	1	2 Aug 1992
Northern bottlenose whale	Hyperoodon ampullatus	1	8 Oct 1992
Minke whale	Balaenoptera acutorostrata	1	25 Jul 1993
Long-finned pilot whale	Globicephala melas	1	27 Aug 1993
Bottlenose dolphin	Tursiops truncatus	1	5 Sep 1993
Minke whale	Balaenoptera acutorostrata	1	10 Oct 1993
Minke whale	Balaenoptera acutorostrata	1	13 Oct 1993
Humpback whale	Megaptera novaeangliae	1	11 Nov 1993
Atlantic white-sided dolphin	Lagenorhynchus acutus	1	Feb 1994
Fin whale	Balaenoptera physalus	1	4 Jul 1994
Sperm whale	Physeter macrocephalus	1	5 Jul 1994
Long-finned pilot whale	Globicephala melas	5	5 Sep 1994
Fin whale	Balaenoptera physalus	1	27 Sep 1994
Atlantic white-sided dolphin	Lagenorhynchus acutus	1	8 Nov 1994
Sperm whale	Physeter macrocephalus	1	12 Dec 1994
Long-finned pilot whale	Globicephala melas	1	5 Jan 1995
Fin whale	Balaenoptera physalus	1	8 Apr 1995
Atlantic white-sided dolphin	Lagenorhynchus acutus	1	11 Apr 1995
Northern right whale	Eubalaena glacialis	1	20 Oct 1995
Humpback whale	Megaptera novaeangliae	1	27 Oct 1995
Long-finned pilot whale	Globicephala melas	1	24 Jan 1996
Harbour porpoise	Phocoena phocoena	1	23 Jul 1996
Atlantic white-sided dolphin	Lagenorhynchus acutus	1	10 Oct 1996
Fin whale	Balaenoptera physalus	1	15 Dec 1996

4. Statutes Protecting Marine Mammals in Canada

There are many Canadian statutes in force that provide for the protection of marine biota and ecosystems on federal lands; lands that also encompass the internal waters, territorial sea, exclusive economic zone, and continental shelf of Canada. Of course, the type and degree of protection varies depending on the intended purpose of each statute.

For example, attention must be paid to the environmental effects on aquatic animals and their habitats from projects ranging from colossal offshore natural gas development ventures to smaller DREA sea trials, by following the guidelines laid out in the *Canadian Environmental Assessment Act*. Marine ecosystems are also protected from deleterious substances being released into the water by people or ships in statutes like the *Arctic Waters Pollution Prevention Act*. The *Coastal Fisheries Protection Act* prevents unauthorized foreign fishing vessels from entering Canadian fisheries waters for any reason, including fishing for marine animals and plants, crustaceans, and shellfish. For the sake of rebuilding threatened fish species, this act also permits Canada to take action against vessels fishing straddling stocks on the Grand Banks. As a final example, the import or export of wild animals and plants (alive, dead, eggs, sperm, embryos, seeds, spores, pollens, or tissue cultures) between Canadian provinces or Canada and a foreign state is prohibited under the *Wild Animal and Plant Protection and Regulation of International and Interprovincial Trade Act*.

While the statutes mentioned above provide protection for wild animals and plants by curbing harmful activities associated primarily with industrial growth and commercial activities, there are statutes and regulations directly aimed at preserving Canada's flora, fauna, and natural habitats. Some of these statutes were in force prior to the 1992 Rio Summit and are discussed in Subsections 4.1 to 4.4. A new 1996 statute that will have an important impact on the sea-going activities of DREA is the *Oceans Act*, which is presented in Subsection 4.5. Finally, a newly proposed statute, the *Canada Endangered Species Protection Act*, which died on the order paper when parliament was dissolved for the 1997 federal election, is outlined in Subsection 4.6. A modified version of this proposed statute is expected to be tabled again in late 1998 or early 1999.

4.1 Migratory Birds Convention Act

In 1916, Canada and the United States agreed to protect many species of birds, whose annual migration routes traverse the borders of our nations, by signing the *Migratory Birds Convention*. This convention came into force in Canada with the passage of the *Migratory Birds Convention Act* in 1917. Essentially, this statute prohibits the unauthorized taking of migratory birds or their nests, and any commercial transactions involving migratory birds, bird parts, eggs, embryos, or tissue cultures.

More importantly, the statute provided for the creation of protected areas where disturbing migratory birds and their nests in any way could be dealt with by law. Areas chosen were usually staging and breeding grounds. By 1996 there were 98 of these protected areas, which are known as Migratory Bird Sanctuaries (MBSs). These sanctuaries are managed by the Canadian Wildlife Service.

Unlike Canada's national parks, most of the MBSs are not well known to the general public. From the tiny 0.08 hectare Christie Islet MBS in British Columbia to the giant 6,278,200 hectare Queen Maud Gulf MBS in the Northwest Territories, the combined size of the MBSs in Canada is approximately 11.3 million hectares, larger than the land area of Iceland and more than twice that of Nova Scotia. These sanctuaries have not only protected bird species at risk, they have also contributed to successful reintroduction programs between Canada and the United States. For example, the Atlantic puffin (*Fratercula arctica*) in the Gulf of Maine was almost wiped out by hunting in the late 1800s [27], but young Newfoundland puffins exported to Maine in the 1970s have allowed this American population to recover [28].

The weaknesses of MBSs are that they do not protect migratory bird habitats or other species of wildlife, including marine mammals. That being said, since many MBSs are adjacent to Canada's internal waters and territorial sea, they may provide very limited protection for marine mammals that spend some time on or near land within a given MBS, such as pinnipeds, polar bears (*Ursus maritimus*), and even belugas (*Delphinapterus leucas*) temporarily trapped by fast ebb tides. For example, there may be circumstances where actions directed at marine mammals simultaneously disturb migratory birds, making those actions subject to MBS regulations.

4.2 Canada Wildlife Act

The lack of protection afforded by the MBS regulations to habitats and other species was addressed in 1973 with the passage of the *Canada Wildlife Act*. This action was deemed necessary as habitat loss and degradation in Canada continued to occur throughout the 1960s and 1970s. With provincial support, the statute allowed the federal government to initiate measures to protect any wild animal, plant, or organism, especially endangered species, and their habitats. Furthermore, provisions now exist for the establishment of protected marine areas in the internal waters, territorial sea, or exclusive economic zone of Canada.

Among the measures taken was the establishment of National Wildlife Areas (NWAs) which, like the MBSs, are managed by the Canadian Wildlife Service and are not well known to the general public. By 1997, the 49 NWAs in Canada totaled approximately 500,000 hectares and ranged in size from the 0.6 hectare Eleanor Island NWA in Ontario to the 262,400 hectare Polar Bear Pass NWA in the Northwest Territories [29]. A number of NWAs overlap with MBSs. A newly proposed marine wildlife area (MWA) at Isabella Bay in the Northwest Territories would protect the endangered bowhead whales (*Balaena mysticetus*) that live there; however, the creation of this refuge will likely have to await the establishment of the new territory of Nunavut as discussed in Subsection 2.1 and perhaps new initiatives under the *Oceans Act* as discussed in Subsection 4.5.

4.3 National Parks Act

Although the primary purpose of the *National Parks Act* is to maintain parklands for the benefit and enjoyment of people, protection is also provided for flora, fauna, and habitats. Parks such as the 1,500 hectare Point Pelee National Park and the 140,636 hectare Kootenay National Park are well known to Canadians and many international tourists. Maintained by the

Department of Canadian Heritage, the 25-plus parks protect numerous bird, fish, and terrestrial mammal species at risk.

The Act also permits the establishment of National Marine Conservation Areas (NMCAs) whose purpose is similar to that of the national parks, namely, to open representative areas of Canada's natural marine heritage for public recreation while protecting wildlife and habitats. The first NMCA, Fathom Five in Georgian Bay, was created in 1987 and has an area of 13,000 hectares. The 305,000 hectare Gwaii Haanas NMCA off the Queen Charlotte Islands of British Columbia was created the following year, and the very popular 113,800 hectare Saguenay-St. Lawrence Marine Park in Quebec draws thousands of tourists for whale watching tours every summer. There they can see harbour porpoises (*Phocoena phocoena*), belugas (*Delphinapterus leucas*), minke whales (*Balaenoptera acutorostrata*), fin whales (*Balaenoptera physalus*), and blue whales (*Balaenoptera musculus*). A whale research program at the park is studying the distribution and movements of cetaceans as well as cetacean behaviours such as their interactions with whale watchers.

4.4 Fisheries Act

Protection of shellfish, crustaceans, marine animals, marine plants, and habitats in the internal waters, territorial sea, and exclusive economic zone of Canada, is provided by the *Fisheries Act*. Undertakings that introduce deleterious substances into the water or damage habitats by any other means such as the use of explosives, are prohibited. The Act also has provisions for the creation of specific regulations that aim to conserve and protect marine animals.

The particular regulations of interest to DREA are the *Marine Mammals Regulations*. In general, they prohibit the disturbance of marine mammals, moving live marine mammals from where they are found, tagging or marking marine mammals, and fishing for marine mammals without authorization. Beluga (*Delphinapterus leucas*), bowhead (*Balaena mysticetus*), and narwhal (*Monodon monoceros*) calves and accompanying adults cannot be taken. The beluga in the Gulf of St. Lawrence, the St. Lawrence River, the Saguenay River, and any of their tributaries are completely protected from fishing. Finally, hunting for adult harp (*Phoca groenlandica*) and hooded seals (*Crystophora cristata*) in whelping or breeding grounds is prohibited.

4.5 Oceans Act

The newest statute concerned with the conservation of marine biodiversity and ecosystems is the *Oceans Act*, which was enacted in 1997. This Act enables the Department of Fisheries and Oceans to develop and manage marine programs for Canada's internal waters, territorial sea, exclusive economic zone, and continental shelf, with a strategy based on sustainable development, integrated management, and a precautionary approach (i.e., err on the side of conservation). Perhaps the most important feature of the Act is the provision to make regulations to establish and control Marine Protected Areas (MPAs).

An MPA is an area in Canadian waters that receives special protection for any of the following reasons [30]:

(a) the conservation and protection of commercial and non-commercial fishery resources, including marine mammals, and their habitats;
(b) the conservation and protection of endangered or threatened marine species, and their habitats;
(c) the conservation and protection of unique habitats;
(d) the conservation and protection of marine areas of high biodiversity or biological productivity; and
(e) the conservation and protection of any other marine resource or habitat as is necessary to fulfil the mandate of the Minister of Fisheries and Oceans.

The process of identifying, creating, and maintaining MPAs is set to begin soon since considerable public consultation has already taken place and a draft MPA policy has been put forward [30]. Once the policy has been generally accepted, the actual task of establishing MPAs will likely require a great deal of partnering. All levels of government may be involved, as well as Aboriginal groups, coastal communities, ocean industries, and individual Canadians. Furthermore, agreements with the governments of our neighbours, the United States, France (St. Pierre and Miquelon), and Denmark (Greenland), may be needed. In some cases, special issues may arise that will require consultation with the Department of National Defence, the Department of Transport, and Natural Resources Canada.

To eliminate the possibility of redundancies and conflicts arising from the conservation initiatives of different federal departments, MPA designations and associated management policies will be coordinated between the Department of Fisheries and Oceans, Environment Canada, and the Department of Canadian Heritage. As mentioned above, Fisheries and Oceans will focus on establishing MPAs, Environment Canada will focus on establishing and maintaining existing MBSs, NWAs, and MWAs, and Canadian Heritage will focus on the establishment of new and maintenance of existing NMCAs and national parks.

4.6 Canada Endangered Species Protection Act

The purpose of the proposed *Canada Endangered Species Protection Act* is to prevent species, subspecies, or geographically distinct populations of animals, plants, or other organisms, from becoming extinct [31]. This necessarily means protecting their habitats as well. The Act will cover all species currently protected by the *Migratory Birds Convention Act* and the *Fisheries Act*, species on federal lands out to the 200 nautical mile limit, and species that cross international borders. In all, the Act will cover endangered species in 60% of Canada. Environment Canada will administer the Act in cooperation with the Department of Fisheries and Oceans and the Department of Canadian Heritage. The provinces and territories are expected to develop legislation and programs that complement this federal statute under the *National Accord for the Protection of Species at Risk*, agreed to in principle in 1996. Some provinces have already enacted appropriate legislation such as *The Wildlife Act (1997)* in Saskatchewan.

Under the proposed Act, COSEWIC will be granted legal status for listing species at risk and will operate independently from the government. COSEWIC will be obliged to use all available sources of information to fulfil its listing mandate including scientific, traditional, and community inputs. Species listed as endangered or threatened will have recovery plans produced within a year or two and in a critical situation, where the survival of a species is in immediate danger, COSEWIC can issue an emergency designation and appropriate actions will be promptly taken.

The proposed Act prohibits any form of harassment directed at endangered or threatened species, and protects their habitats. The proposed penalties for infractions include fines for companies not exceeding $500,000, $250,000 or imprisonment for individuals, and fines up to $1,000,000 for repeat offenders. Should this Act come into force, it promises to go a long way towards fulfilling Canada's commitment at the 1992 Earth Summit.

5. Recommendations

There are many marine mammal issues relevant to DREA's sea-going activities that were not discussed in this report due to time constraints. For example, for planning purposes, it would be useful to know the types of marine mammal species found in our trial areas, their approximate numbers, the times of year they are there, the locations of their breeding, feeding, and calving grounds, and their migratory paths.

We should also find out more about the Department of Fisheries and Oceans's harbour porpoise (*Phocoena phocoena*) management/recovery plan. As well, Duke University's harbour porpoise program in the waters off New Brunswick, and Dalhousie University's bottlenose whale (*Hyperoodon ampullatus*) program in the submarine canyon known as the Gully near Sable Island off Nova Scotia, should be investigated. Both of these programs have received funding for the year 1998-1999 under the Endangered Species Recovery Fund administered by the World Wildlife Fund Canada in partnership with Environment Canada.

As far as provincial statutes for the protection of marine mammals are concerned, some already exist or are currently in the making and DREA should become familiar with them. Particular attention should be paid to the new Marine Protected Areas program, and the Department of National Defence should consider participating in the on-going activities that will soon see the creation of pilot MPAs. One area under consideration as an MPA by the Department of Fisheries and Oceans is the Gully mentioned above.

Internationally, DREA should examine the marine mammal protection policies of France (St. Pierre and Miquelon), Denmark (Greenland), and the United States, since our trials take us into their jurisdictional waters from time to time. In the case of the United States, whose waters we visit most often, we should become acquainted with their 1972 *Marine Mammal Protection Act*, their 1973 *Endangered Species Act*, the rules and regulations regarding their 12 National Marine Sanctuaries, and their humpback (*Megaptera novaeangliae*) and northern right whale (*Eubalaena glacialis*) programs.

6. Summary

Canada is a country that prides itself on its rich biological diversity and the splendor of the seascapes and landscapes that can be found throughout our provinces and territories. In this report we probed some of the reasons why Canadians have strong opinions about protecting our natural resources, particularly marine mammals. These opinions are reflected in the many established programs and laws that are dedicated to their conservation nationwide, some of which were discussed in this report. As we steadily improve our understanding of the life-threatening predicament many marine mammal species are facing, we are becoming more holistic in our approaches; creating protected wildlife areas to conserve complete ecosystems, adopting the principles of sustainable development, and creating opportunities for all Canadians to participate in formulating effective legislation. In this, the United Nations International Year of the Ocean, it is fitting that Canada is embarking on many new ocean-related conservation initiatives that will, in all likelihood, benefit future Canadians for years to come.

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This report gives an overview of the efforts to protect marine mammals and their habitats in Canada. The socio-economic impact that commercial whaling, sealing, and overfishing have had on the general public is highlighted in order to understand why Canadians care about the long-term perpetuation of our diverse national ecosystems. Canada has initiated many programs to identify and recover species at risk and the three examples discussed epitomize these efforts. Finally, the conservation of all forms of wildlife in this country, whether abundant or endangered, is engrained in our federal statutes and regulations and several examples are given.

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stranding networks
naval sonars
whales
dolphins
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walruses